Heat and Changes in Matter

3-4 The student will demonstrate an understanding of the changes in matter that are caused by heat.

3-4.3 Explain how heat moves easily from one object to another through direct contact in some materials (called conductors) and not so easily through other materials (called insulators).
Taxonomy level: 2.7-B Understand Conceptual Knowledge

Previous/Future knowledge: The concept of heat moving from one object to another is new material for this grade level. Students will further develop the concept of forms of energy (light and electricity) in 4th grade (4-5.2 and 4-5.5).

It is essential for students to know that heat makes things warmer. Some materials allow heat to move through them easily and others do not as follows:

Conductors
- Some materials allow heat to move easily through them and from one object to another through direct contact.
- These materials are called *conductors*.
- If a metal spoon, for example, is put in hot water, it will become warmer.
- Metal objects are good *conductors* of heat, and they get warmer.

Insulators
- Other materials do not allow heat to move easily through them and are called *insulators*.
- If wooden and plastic spoons are put in hot water, for example, they do not become warmer.
- These materials do not allow heat to move easily through them.
- Plastic and wood materials are *insulators,* and they do not get warmer.

It is not essential for students to know that heat is a form of energy that causes the particles in matter to move faster, or that it is also transferred by convection or radiation.

Assessment Guidelines:
The objective of this indicator is to *explain* that heat either moves easily in some materials called conductors or not so easily in other materials called insulators; therefore, the primary focus of assessment should be to construct a cause-and-effect model of heat moving easily in a conductor or not so easily in an insulator. However, appropriate assessments should also require students to *illustrate* or *exemplify* insulators and conductors; *classify* materials as either insulators or conductors; *compare* insulators and conductors; or *identify* materials as either insulators or conductors.